

AD No. 407124

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REPORT OF RESULTS -
PROJECT AF 61-2
EASTERN PACIFIC SURVEY,

VOL. II,



11 15 JUNE 1963,

1370TH PHOTO-MAPPING WING
AIR PHOTOGRAPHIC & CHARTING SERVICE (MATS)

JUN 20 1963
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Handwritten note: H-10-1 326712

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HIRAN STATION DESCRIPTION

Name and Number: KURE HIRAN (1) Location: Green Island, Kure Atoll
Hawaiian Island Group

Date Established: 1961

Approximate Geographic Coordinates: Latitude 28° 25' N
Longitude 178° 18' W

Station Elevation: 20 Feet (Map Elevation)

Description: Station is located on Kure, an oval shaped reef with one large island (Green Island) on the southeast circumference. The main island is about 1 mile long and 1/2 mile wide. The station is located on the north central end of Green Island, atop a low sand dune, approximately 25 feet north of the center-line of a track road. Station is marked by a USC&GS triangulation disk stamped "KURE HIRAN-1961" which is set in a concrete monument 12 inches in diameter protruding 6 inches above the ground.

References: R.M. 1 is a USC&GS reference disk stamped "KURE HIRAN NO 1-1961" set in a concrete filled tile cylinder 10 inches in diameter protruding 2 inches above the ground. Kure Astro is a USNHO reference disk stamped "KURE ASTRO-1959" set in a mass of concrete flush with the ground. The astro station was used for Sodano observations and a 14 foot wooden stand was constructed over the station to facilitate azimuth observations. The azimuth mark is a U.S. Coast Guard survey marker stamped "REF 3" set in a concrete monument 10 inches in diameter and flush with the ground. It is located atop the knoll in front of the main Coast Guard buildings.

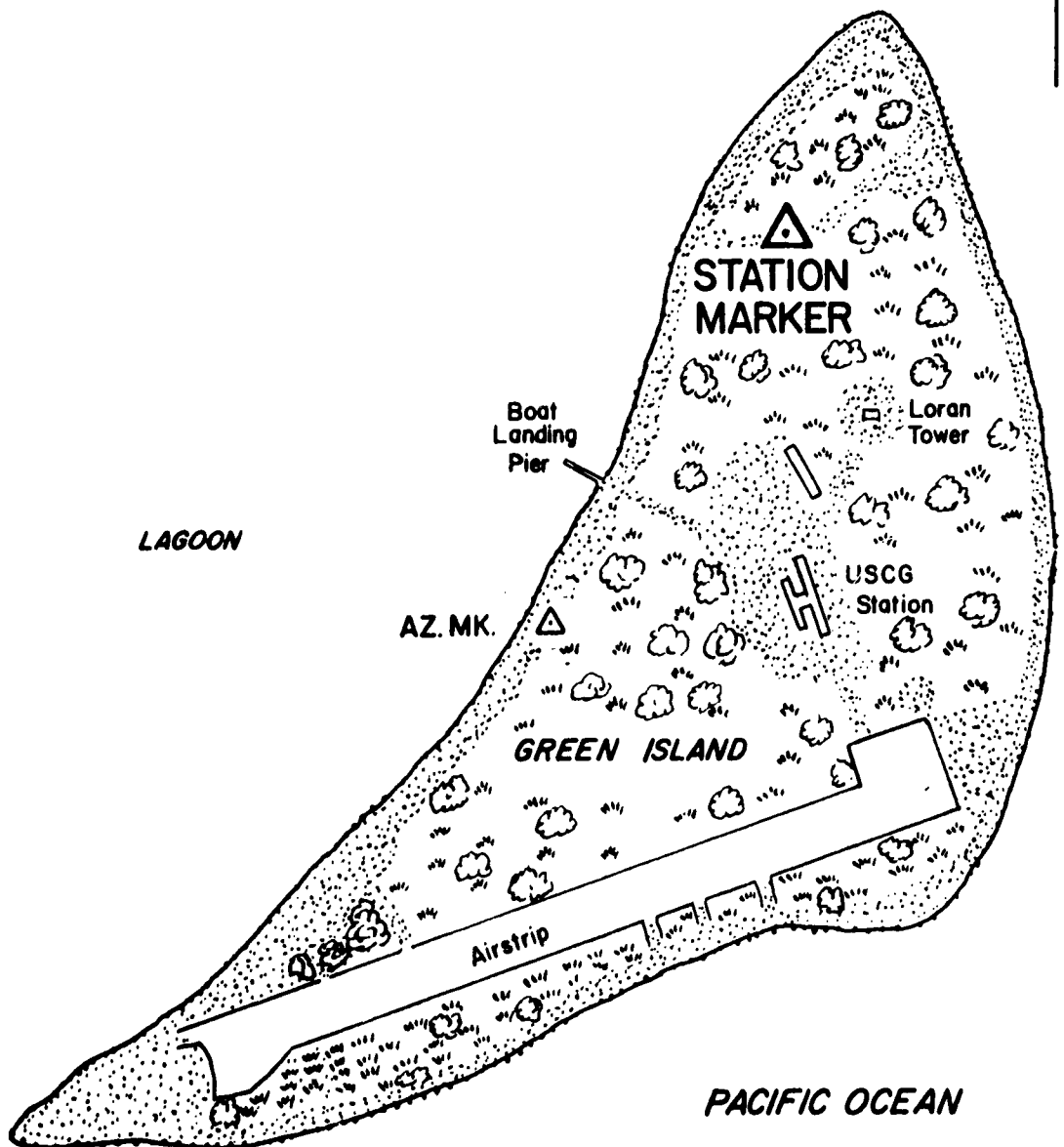
<u>OBJECT</u>	<u>DISTANCE (FEET)</u>	<u>AZIMUTH FROM SOUTH (ASTRONOMIC)</u>
RM #1	20.84	330° 40' 32"7
Kure Astro 1959	126.36	57° 17' 12"9

Observations from Kure Astro 1959:

Azimuth Mark	20° 01' 14"00
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Route Description: The station is reached by air; there are flights between Kure and Midway about 3 times a week, also Kure is within helicopter range of Midway. The air strip is made of coral and located in the southeast corner of the island. No aviation gas or repair facilities are available. There is a small boat channel in the south perimeter of the reef which will permit entry into the lagoon where the water is 6 to 12 feet deep. A small boat pier has been constructed on the lagoon side of the large island. Small boats should attempt entry through the reef only in very favorable weather. The station can be reached by four wheel drive vehicle by going north on the east beach and turning west on a track road before reaching the north end of the island.

AREA SKETCH KURE HIRAN(I)



MARCH 1961

SCALE

0 1/8 1/4

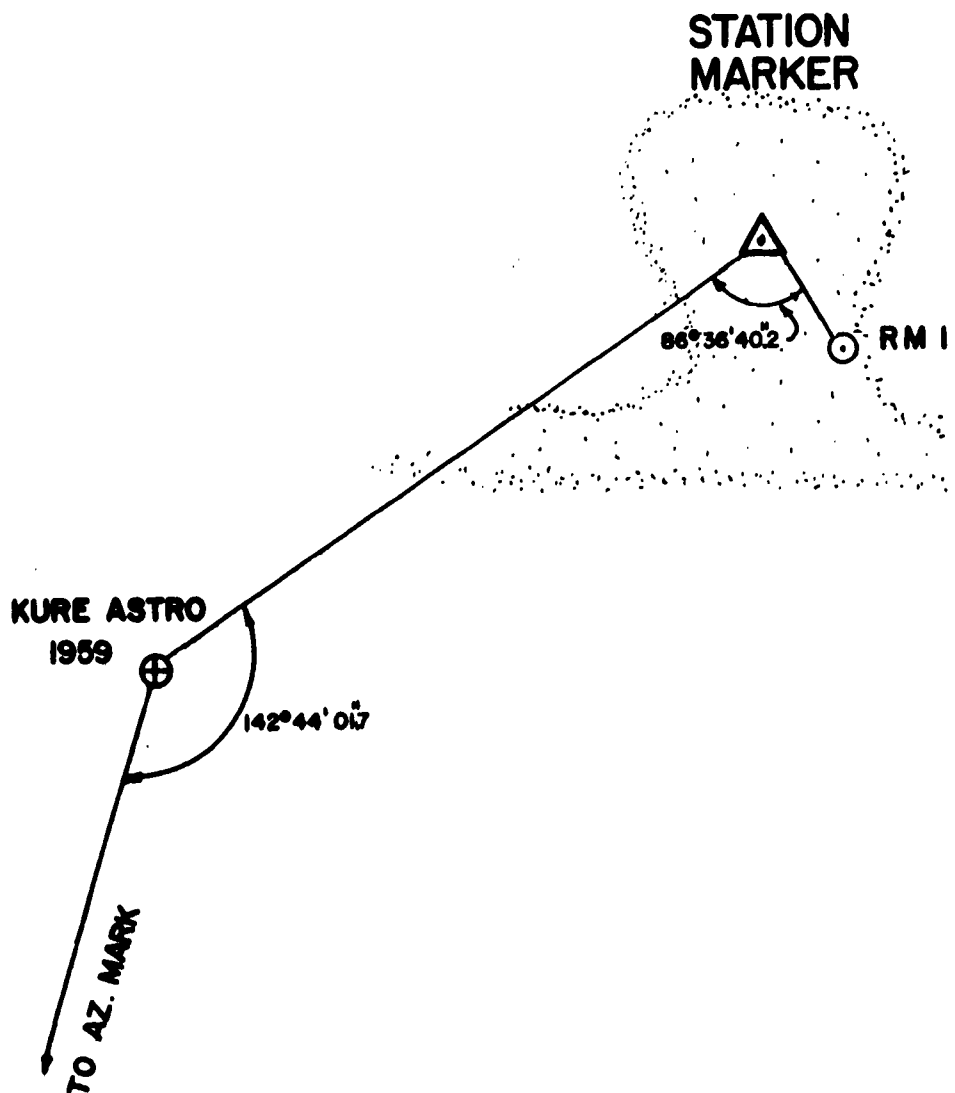
APPROX MILE



Grass & Mangrove Brush

STATION SKETCH

KURE HIRAN(I)



MARCH 1961

SCALE

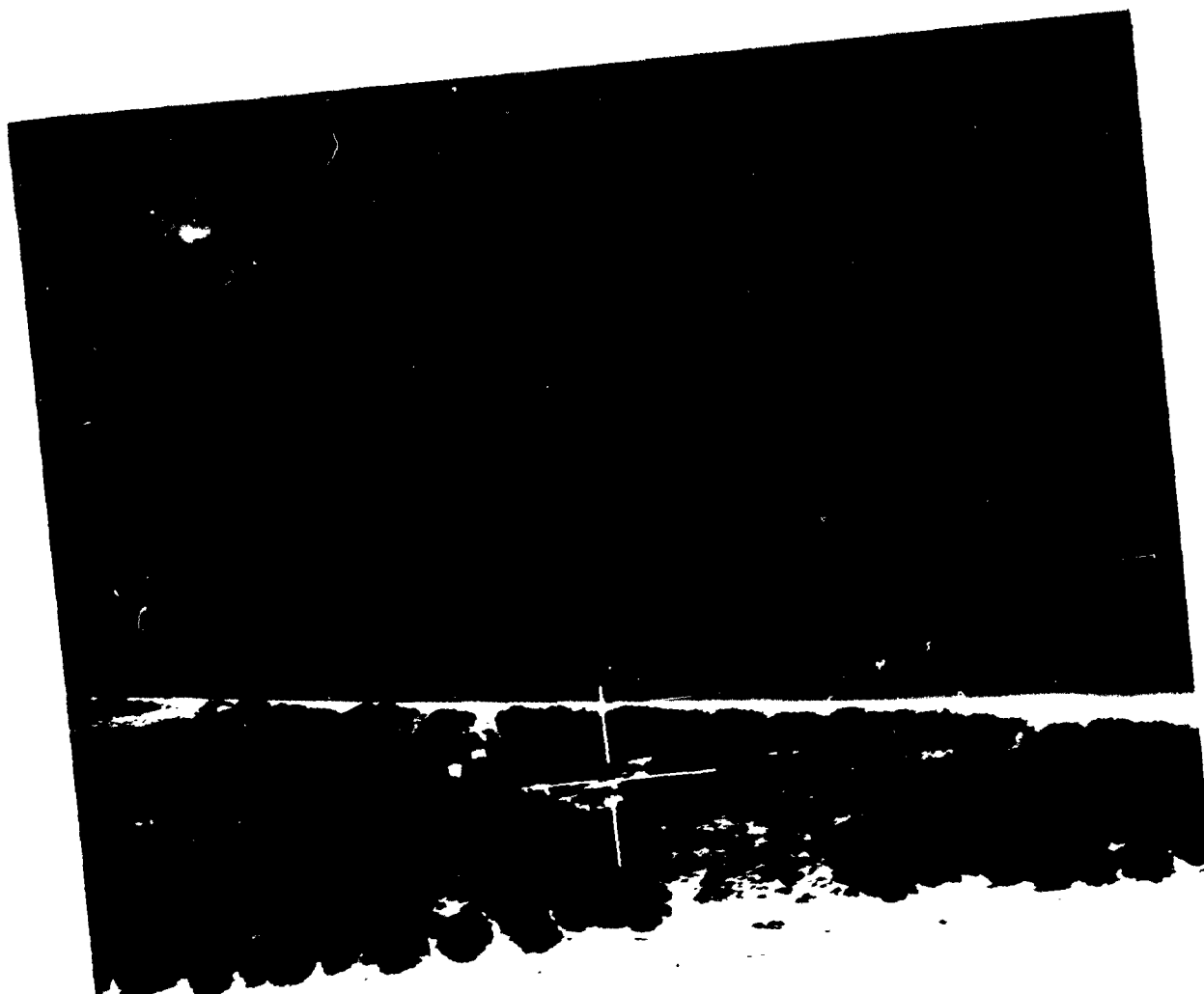








PROJECT 61-2
KURE NARAN (I)
LAT 28°24'N LONG 178°18'W



PROJECT F 61-2
KURE MARAN (I)
LAT 28° 24' N LONG 178° 18' W



PROJECT AF 61-2
KURE HIRAN (I)
LAT 28°24'N LONG 178°18'W

HIRAN STATION DESCRIPTION

Name and Number: MIDWAY (2)

Location: Sand Island
Midway Islands

Date Established: 15 March 1961

Approximate Geographic Coordinates: Latitude: 28° 12' N
Longitude: 177° 23' W

Station Elevation: 20 Feet (Differential leveling from estimated mean tide)

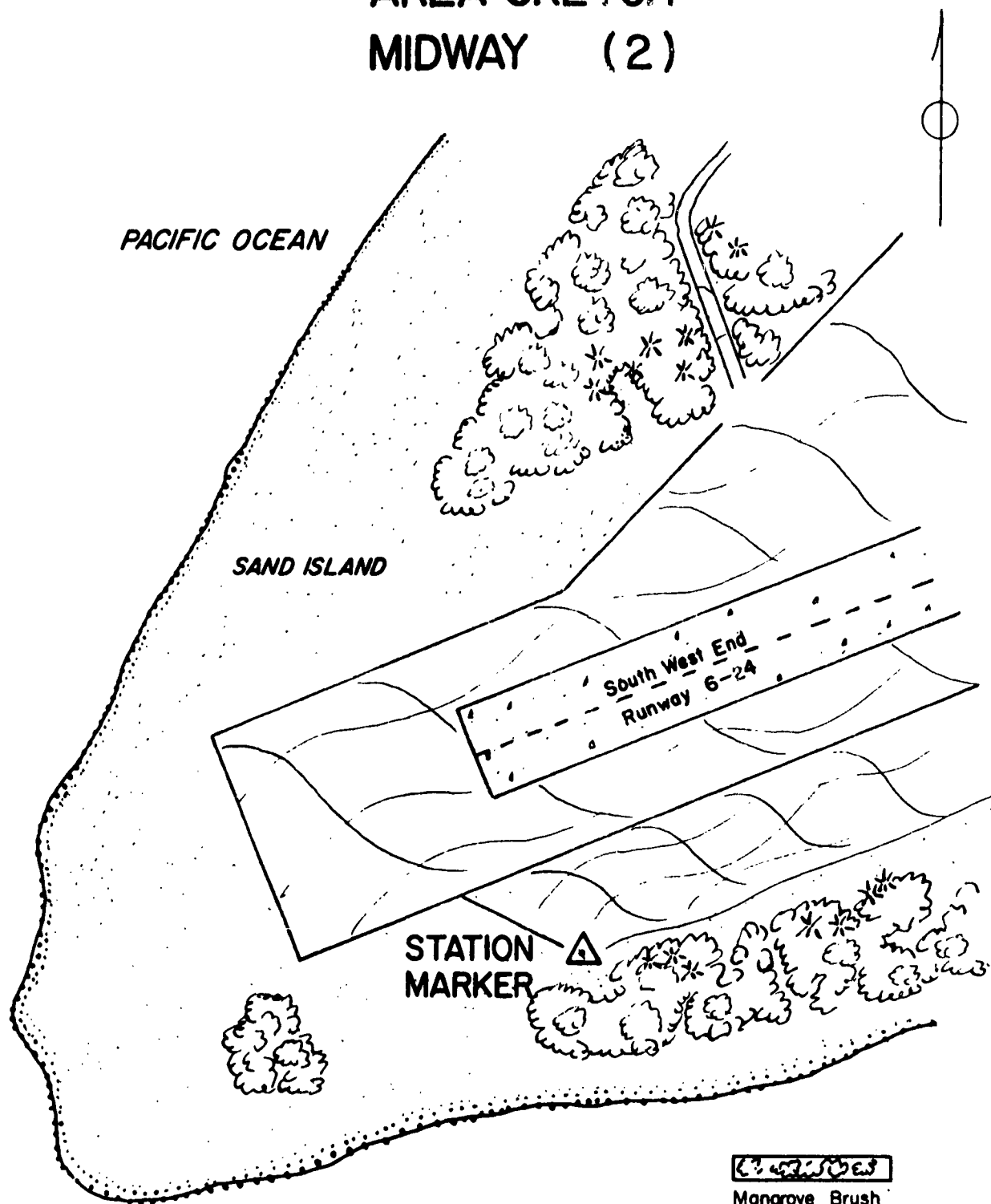
Description: The station is located at Frigate Point, which is the southwestern corner of Sand Island in the Midway Islands of the Hawaiian Archipelago. The station is approximately 500 feet south-southeast of the southwest end of the northeast-southwest runway, on a stabilized coral sand surface used as a turn-around on the access road for the airstrip. It is monumented with a standard USAF Geodetic Survey disk, inscribed "MIDWAY 1961", mounted in the top of a concrete filled 12 inch terra cotta pipe protruding 10 inches above the surface. The sub-surface marker is a standard USAF disk mounted in concrete approximately 48 inches below the surface marker and separated from the terra cotta pipe by six inches of sand. It is stamped "MIDWAY 1961".

References: Reference Markers #1 and #2 are standard USAF reference marker disks, stamped "MIDWAY 1" and "MIDWAY 2" respectively, mounted in the top of concrete filled precast water pipes, 36 inches long, which are imbedded in concrete footings 24 inches in diameter and protrude 6 inches above the surface. RM #2 was occupied as the Sodano light crossing station. An azimuth marker set by USAF personnel is a standard USAF reference marker disk, stamped "MIDWAY AZI", leaded in a drill hole on the concrete rim of a manhole, northeast and across the runway from the station marker. An azimuth marker set by USC&GS personnel is a standard USC&GS azimuth marker disk stamped "MIDWAY 1961", set in a concrete post; it is reached from the Navy laundry building by the access road, crossing the aircraft taxiway, continuing 0.2 mile further, then turning right on a dirt road for about 100 feet, then going about 25 feet to the right of the center line of the road. An azimuth was also measured to the red light on top of the farthest left (facing from station) of three water tanks.

<u>OBJECT</u>	<u>DISTANCE (FEET)</u>	<u>AZIMUTH FROM SOUTH (ASTRONOMIC)</u>
RM #2	43.26	136° 09' 40"
RM #1	57.42	269° 39'
AZ MK (USAF)	1966 (Approx)	219° 00'
From RM #2		
AZ MK (USC&GS)	8000 (Approx)	241° 48' 13.59"
WATER TOWER LIGHT	7500 (Approx)	219° 23' 02.13"

Route Description: U.S. Navy Station, Midway Island, reached by air or surface vessel.

AREA SKETCH MIDWAY (2)



MARCH 61

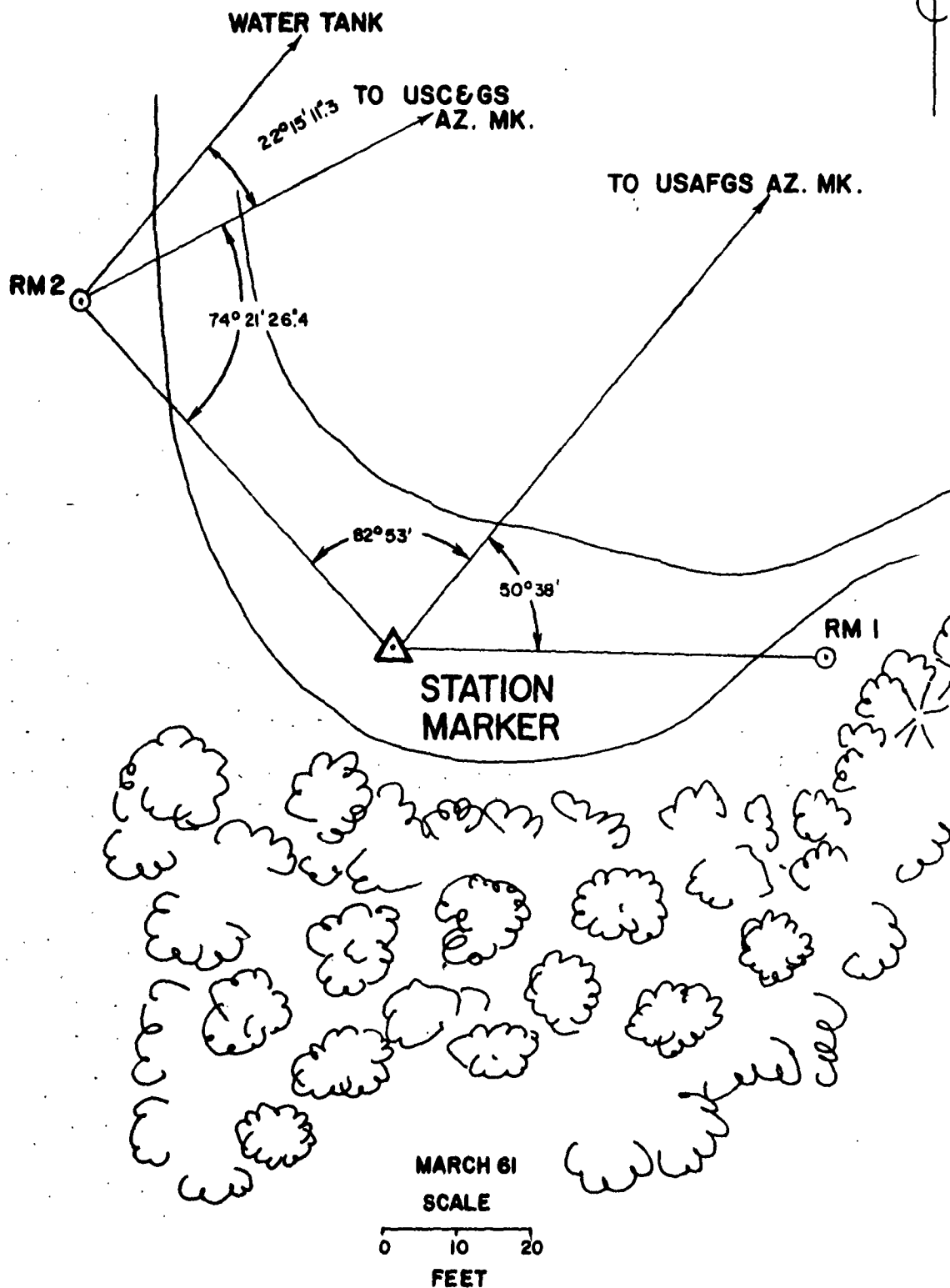
SCALE

0 250 500
FEET



Mangrove Brush

STATION SKETCH MIDWAY (2)





1-2

ECT
WAY





PROJECT 61-2
MIDWAY
LAT. 28°12'N LONG. 177°23'W



PROJECT AF 61-2
MIDWAY (2)
LAT. 28°12'N LONG. 177°23'W



ECT. 61

HIRAN STATION DESCRIPTION

Name and Number: PEARL (3)

Location: Pearl & Hermes Reef,
Hawaiian Island Group

Date Established: 1961

Approximate Geographic Coordinates: Latitude: 27° 47' N
Longitude: 175° 49' W

Station Elevation: 7 feet (Approximate reference to MSL)

Description: Station is located on Southeast Island, midway between the north and south beach and approximately 200 feet from the east beach which has the only possible boat landing on the seaward side of the reef. Station is marked by a standard USC&GS triangulation disk stamped "PEARL 1961" imbedded in a concrete monument 12 inches square and flush with the ground.

Reference: The station is referenced to a number of survey marks which were existing from previous surveys. They are as follows: A U.S. Navy Hydrographic Office reference disk stamped "PEARL ASTRO REF". A USNHO triangulation disk stamped "PEARL ASTRO 1959" set in a concrete monument 18 inches square by 36 inches. This station was occupied as the light crossing station for the azimuth observations. An Astro pier (not described).

Azimuth observations were accomplished to two points:

- (1) A USNHO survey disk stamped "NAVY 1936" capping a pipe protruding 10 inches above the surface and;
- (2) A USNHO reference disk stamped "PEARL REF".

<u>OBJECT</u>	<u>DISTANCE (FEET)</u>	<u>AZIMUTH FROM SOUTH (ASTRONOMIC)</u>
"PEARL ASTRO REF"	39.8	Approx due south
"PEARL ASTRO 1959"	31.26	15° 50' 58"

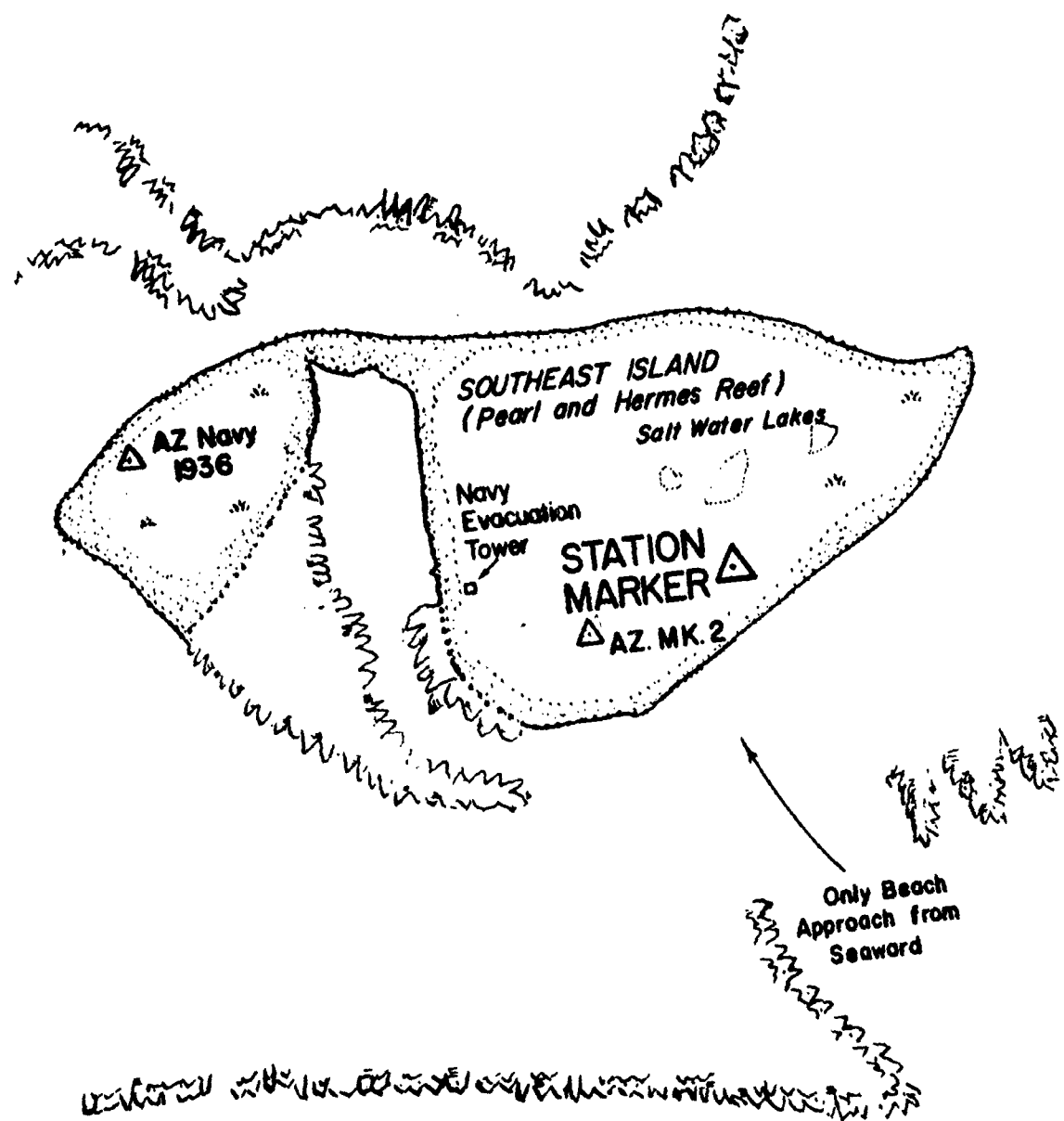
Observation from "PEARL ASTRO-1959"

Astro Pier	20.29	327° 52' 25.3
"NAVY 1936"	1784.7	107° 49' 50.10
"PEARL REF"	463.	84° 03' 28"

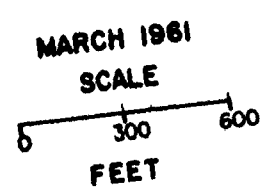
NOTE: There are other survey markers in the vicinity that are not described above.

Route Description: Station is reached by surface ship from Midway Island. There is a break in the reef adjacent to Southeast Island, and a small boat (LVP) can make passage through this break and beach on the island. Extreme caution should be used in the approach and transit of the break. Soundings should be taken continuously. Outside of the reef the bottom appeared mostly coral.

AREA SKETCH PEARL (3)

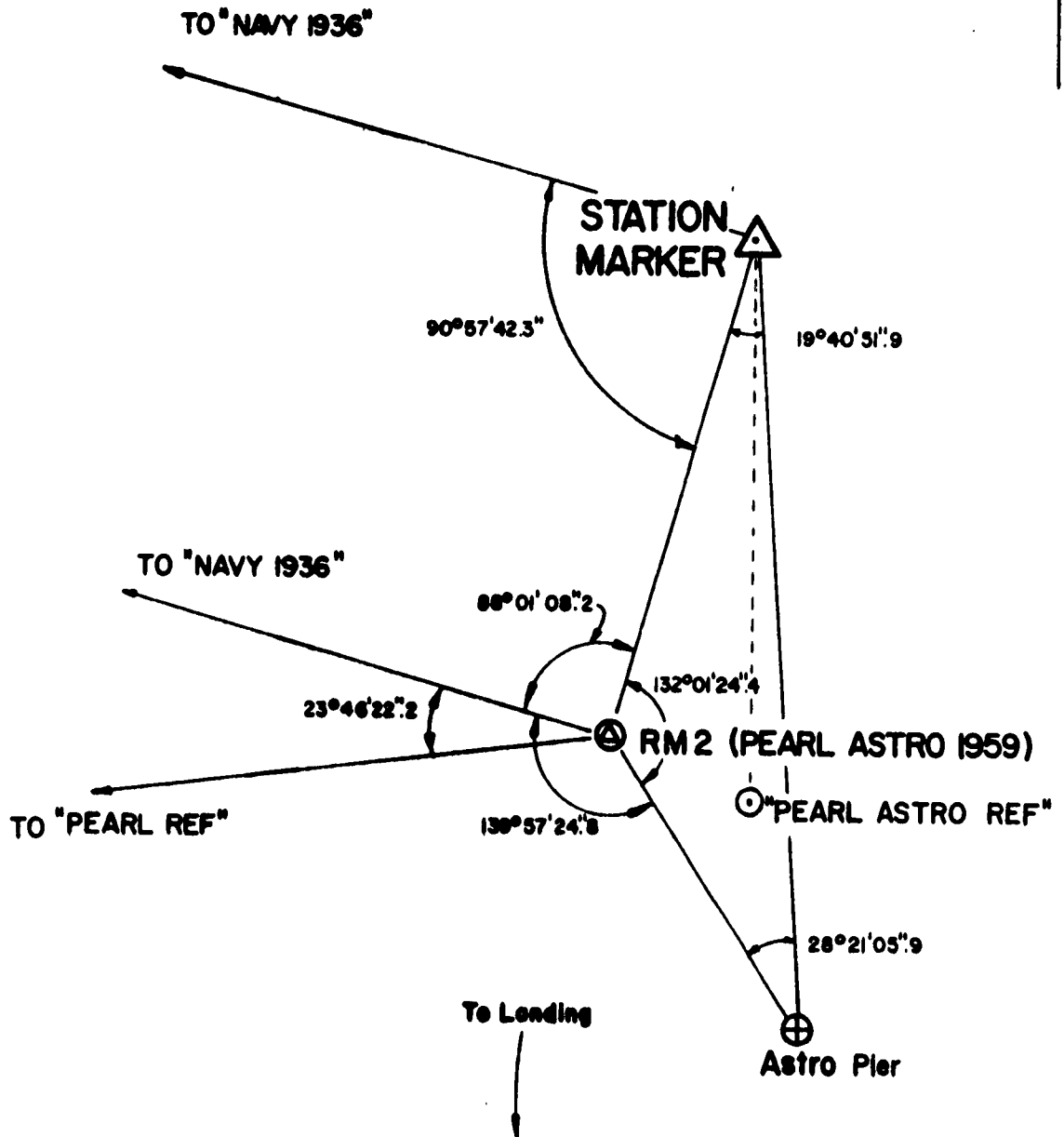


PACIFIC OCEAN



STATION SKETCH

PEARL (3)



MARCH 1961

SCALE

0 5 10

FEET











HIRAN STATION DESCRIPTION

Name and Number: LISIANSKI (4)

Location: Lisianski Island,
Hawaiian Island Group

Date Established: 1961

Approximate Geographic Coordinates: Latitude: 26° 04' N
Longitude: 173° 58' W

Station Elevation: 20 Feet (Approximate reference to mean sea level)

Description: The station is located on the west side of Lisianski Island on a prominent sand ridge which runs parallel to the west shore. It is about 400 feet from the shoreline and about 400 feet east and slightly south of a clump of pine trees, towards the north end of the island. The station is a standard USC&GS triangulation disk inscribed "LISIANSKI 1961" and set in a block of concrete flush with the ground.

References: RM #1 is a standard USC&GS reference disk set in concrete and inscribed "LISIANSKI NO 1 1961". RM #2 is a standard USC&GS reference disk set in concrete and inscribed "LISIANSKI NO 2 1961". RM #2 was occupied as the light crossing station for the Sodano azimuth observations. Lisianski azimuth is located at the south end of the island and approximately 390 feet north of the island's tip. It is atop an east-west sand dune ridge, and about 250 feet east of the highest dune which is near the southeast shoreline. It is a standard USC&GS azimuth disk stamped "LISIANSKI 1961".

<u>OBJECT</u>	<u>DISTANCE (FEET)</u>	<u>AZIMUTH FROM SOUTH (ASTRONOMIC)</u>
RM #1	51.30	66° 09' 30
RM #2	36.79	150° 44' 49

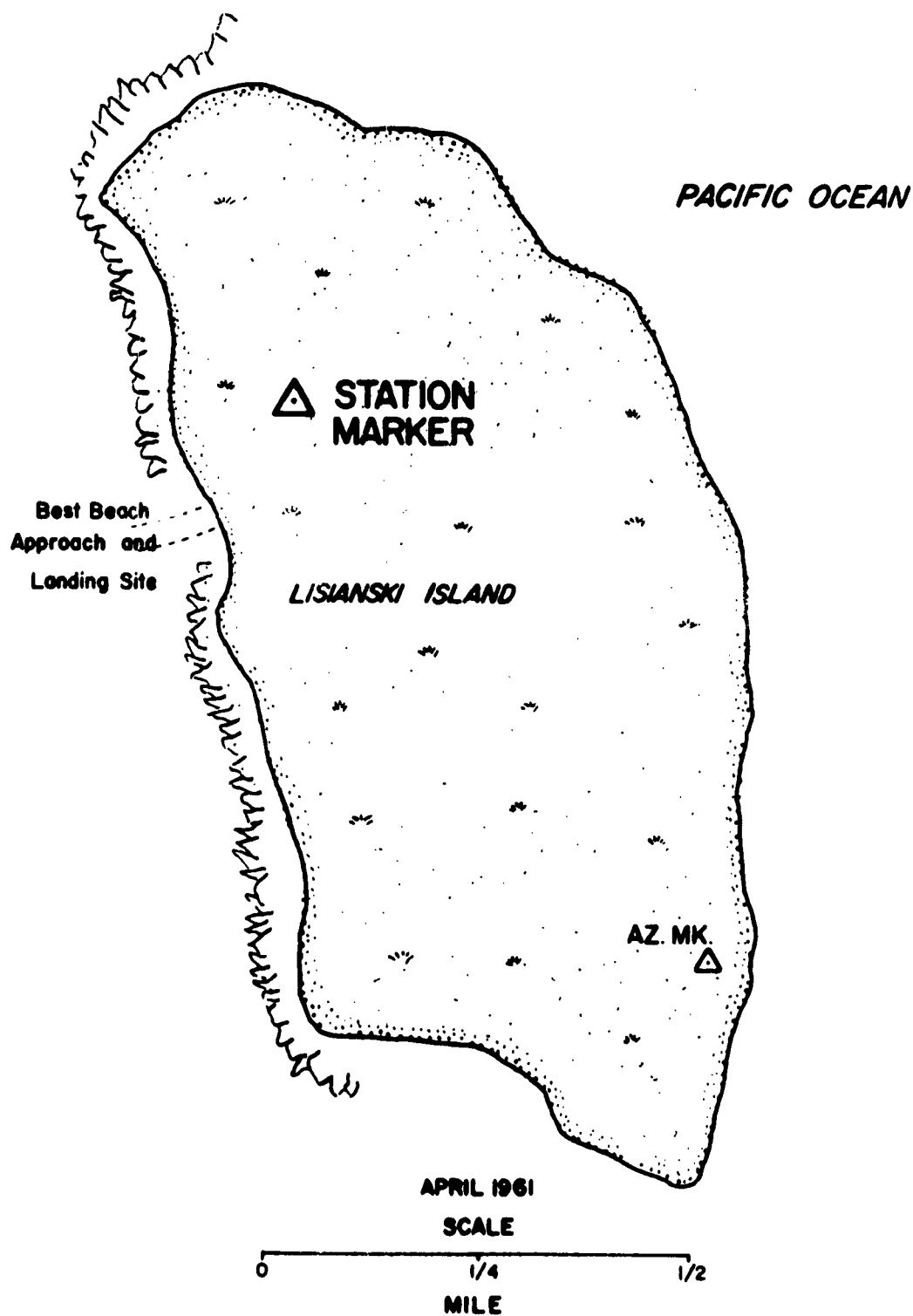
Observation from RM #2

Azimuth Mark	4500 (Approx)	322° 05' 41.94
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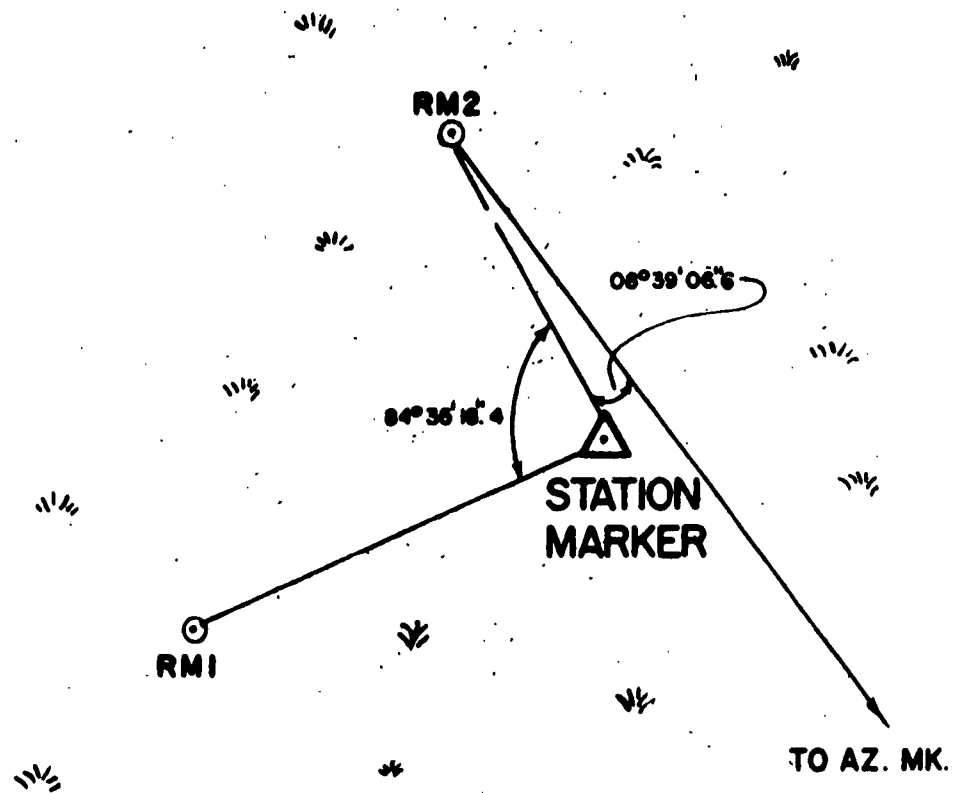
NOTE: A USC&GS station stamped "LAT AND LONG 1931" lies about 750 feet south of the station on the highest point of a ridge.

Route Description: Lisianski Island is reached by surface ship from Midway Island. There are two possible boat approach lanes on the west side of the island. The channel used would depend on sea and wind conditions. Extreme care should be used in approaching the island due to the coral reefs that extend far out from the island. The break in the reef on the west side can be easily seen as the waves break over the reef under all weather conditions.

AREA SKETCH LISIANSKI (4)



STATION SKETCH LISIANSKI (4)

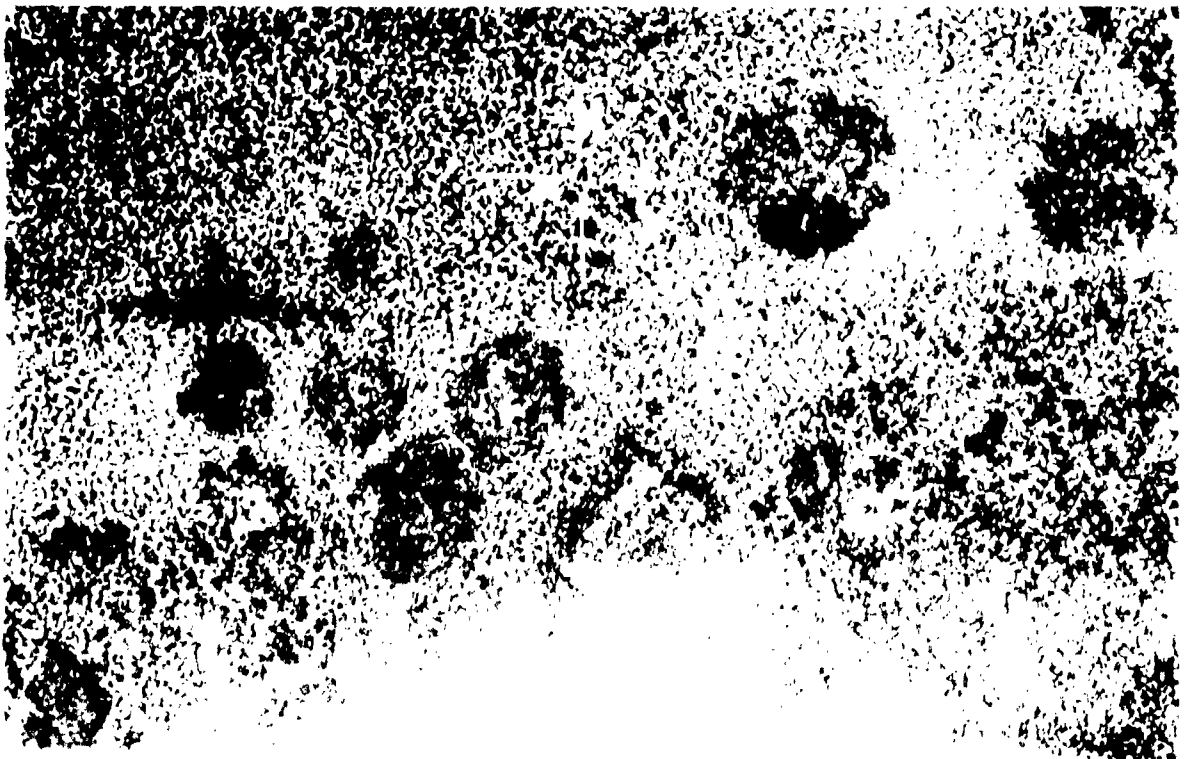
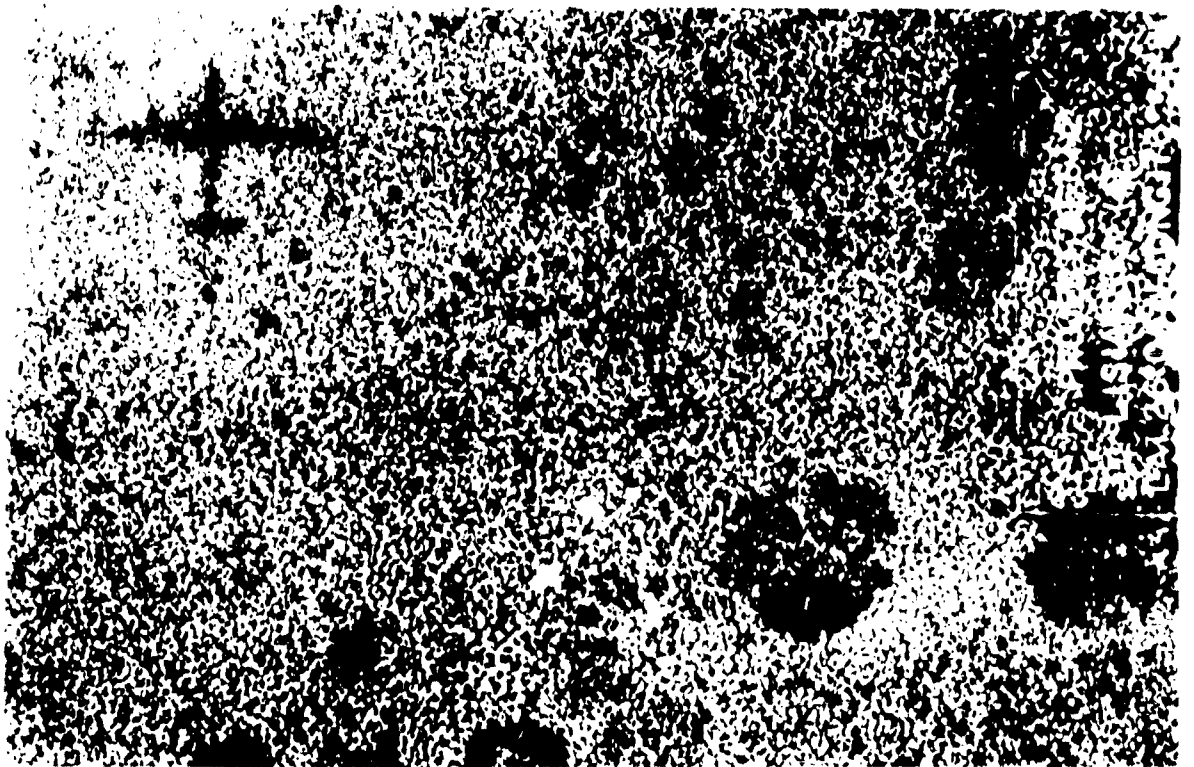


APRIL 1961

SCALE

0 10 20

FEET







PROJECT AF-2
LEONARDI (4)
LAISAN LONG 173°58'W





HIRAN STATION DESCRIPTION

Name and Number: LAYS (5)

Location: Laysan Island,
Hawaiian Island Group

Date Established: 1961

Approximate Geographic Coordinates: Latitude: 25° 46' N
Longitude: 171° 44' W

Station Elevation: 25 Feet (Approximate reference to mean sea level)

Description: The station is located on the western side of Laysan Island on the highest point of the ridge which lies between the beach and the middle lagoon. It is approximately 200 feet east of the sand beach which is the terminus of the best boat approach and landing site on the island. The station is located in a clear, level, sand-guano covered area approximately 125 feet northeast of the conspicuous and only iron-wood tree on the island. The station is marked with a standard USC&GS triangulation disk inscribed "LAYS 1961", set in a 12 inch square concrete monument, which surrounds a 5 foot length of 2 inch galvanized pipe driven in the ground.

References: RM #1 is a 5 foot length of 3 inch angle iron driven in the ground with a mound of concrete around it. The angle iron projects 24 inches above the ground. RM #2 is a standard USC&GS reference disk stamped "LAYS-RM 2-1961", set in concrete atop a 16 inch square concrete pillar projecting 4.5 feet above the ground. There is a T 3 tribrach placed over it. Lays Azimuth is an unstamped USC&GS triangulation disk set in cement in top of a five foot length of galvanized pipe driven in the ground and projecting 2 feet above the ground. It is located on the high sand dune at the edge of the vegetation at the north end of the island. Laysan Magnetic is located approximately 275 feet northeast of LAYS-RM2-1961 and is a USC&GS BM disk set in the top of a 9 foot length of 3 inch copper pipe projecting 2 feet above the ground.

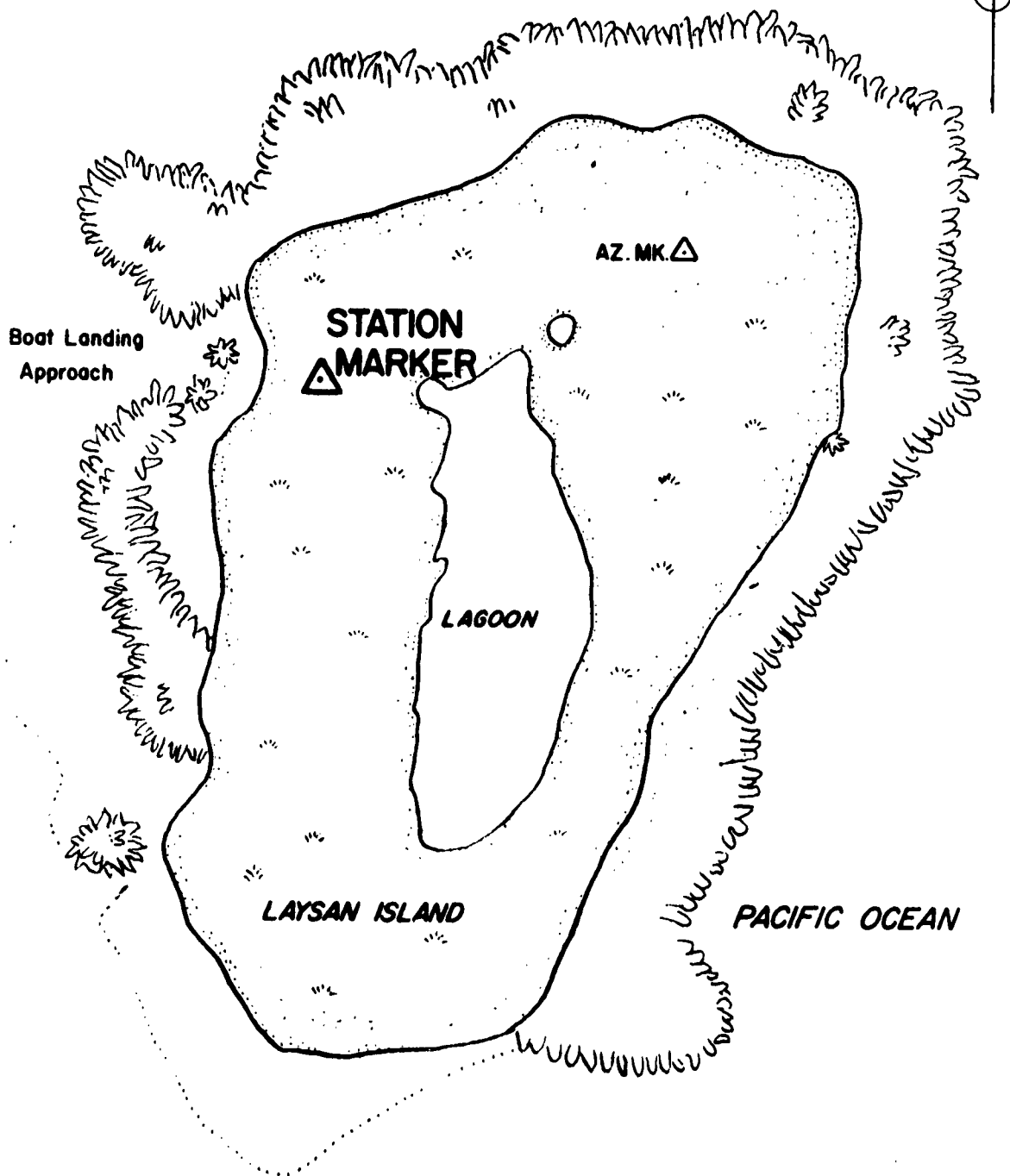
<u>OBJECT</u>	<u>DISTANCE (FEET)</u>	<u>AZIMUTH FROM SOUTH (ASTRONOMIC)</u>
RM #1	30. (Approx)	212° 14' 12
RM #2	67.5	05° 46' 03

Observations from RM #2

Laysan Magnetic		
1930	275.33	248° 35' 02
Lays Azimuth		211° 29' 57.98

Route Description: Laysan Island is reached by surface ship from Midway Island. There is a narrow channel in the coral that permits boat access to the beach. This is on the west side of the island in the general vicinity of the ironwood tree. Anchorage at 2000 yards is recommended due to the coral which almost completely surrounds the island.

AREA SKETCH LAYS (5)

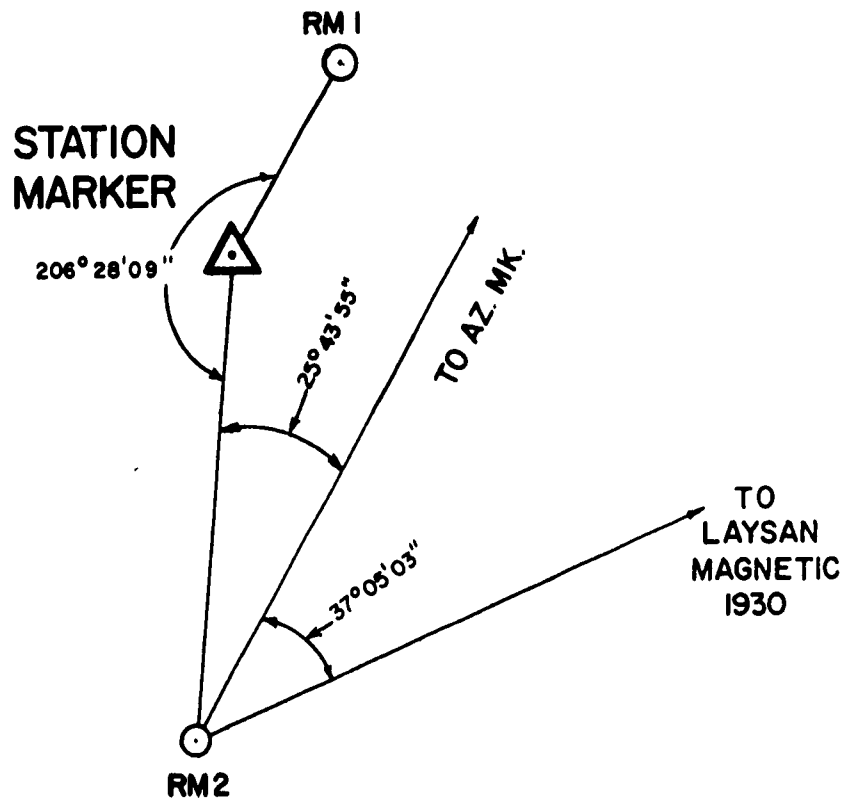


APRIL 1961

SCALE

0 1/4 1/2
MILE

STATION SKETCH LAYS (5)



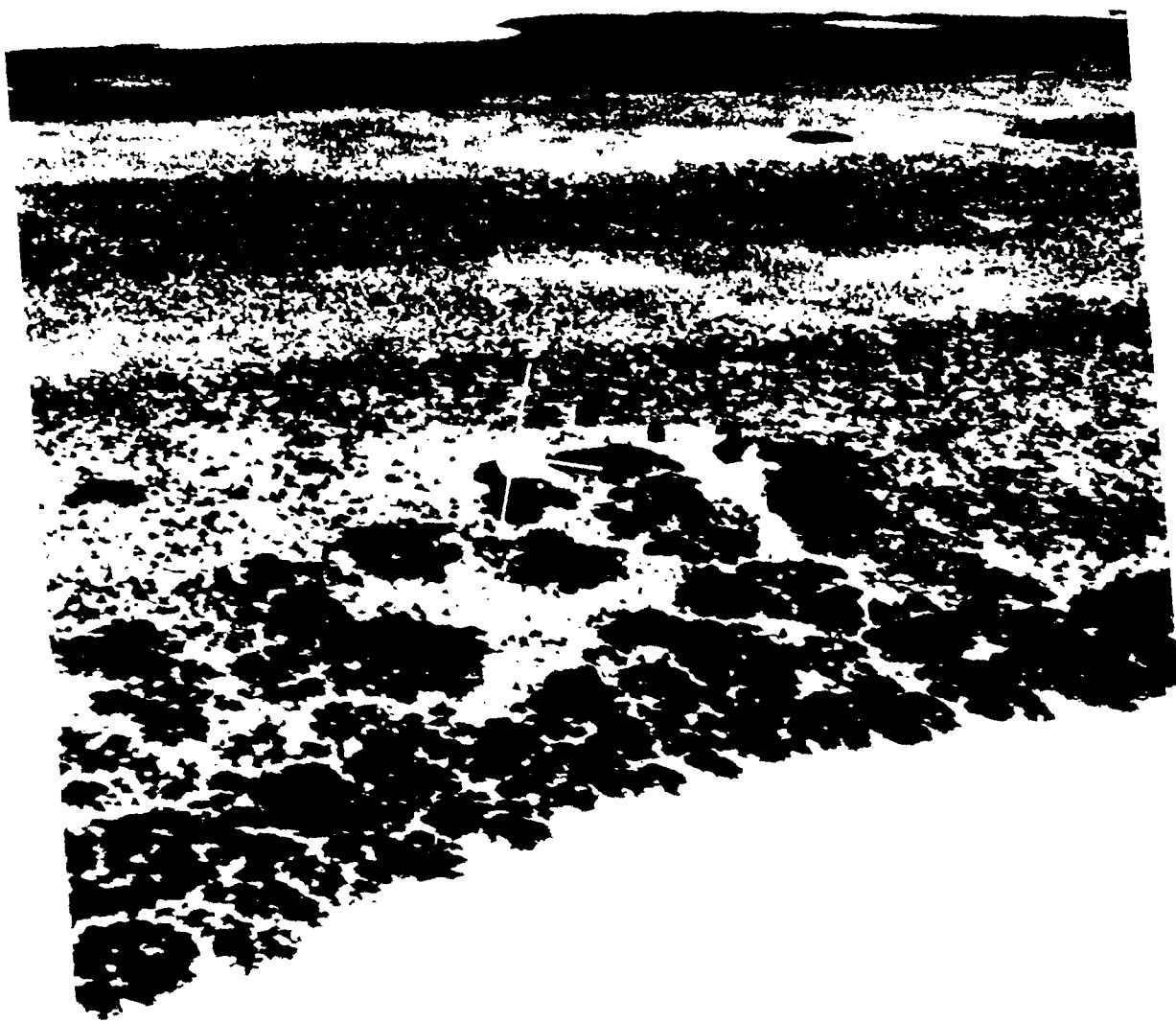
APRIL 1961

SCALE

0 10 20 30

FEET







PROJECT A-01



PROCESSED AT

1981

1981

1981



LAYS

LAT. 25°46'N LONG. 171°24'W

HIRAN STATION DESCRIPTION

Name and Number: GARDNER (6)

Location: Gardner Pinnacles,
Hawaiian Island Group

Date Established: 1961

Approximate Geographic Coordinates: Latitude: 25° 00' N
Longitude: 168° 00' W

Station Elevation: 190 Feet (Approx)

Description: Gardner Pinnacles is a double-peaked island about 200 yards long and 75 yards wide. It originally came to sharp but ragged peaks but now the top of the main pinnacle has been leveled to an area about 15' X 30'. The Hiran station is a standard USC&GS disk, stamped "GARDNER 1961", set in a concrete monument in the center of the leveled area. Another 8' X 12' area was cleared and leveled on the south slope of the main pinnacle to be used for the Astro site. First-order astronomic observations were performed on this site.

References: RM #1 is a standard USC&GS reference mark disk stamped "GARDNER NO 1 1961", and placed in a drill hole in bedrock. It is about 20 feet lower than the station and about 10 feet from a vertical cliff. A rock cairn stands over this mark. RM #2 is a standard USC&GS reference disk stamped "GARDNER NO 2 1961", placed in a drillhole in the top of a prominent outcropping boulder. It is about 15 feet lower than the station. RM #3 is marked by a tribach set in a concrete pier 3.2 feet high by 16 inches square. RM #3 was occupied as the light crossing station for the Sodano azimuth observations. The azimuth mark is near the edge of a cliff and 10 feet north of the highest point of the south pinnacle. It is a standard USC&GS azimuth disk and is stamped "GARDNER 1961".

<u>OBJECT</u>	<u>DISTANCE (FEET)</u>	<u>AZIMUTH FROM SOUTH (ASTRONOMIC)</u>
RM #1	39.1 (Slope Distance)	276° 07' 20"
RM #2	23.1 (Slope Distance)	52° 17' 53"
RM #3	16.8	345° 48' 23"

Observation from RM #1

Azimuth Mark	300. (Slope Distance)	01° 24' 36".98
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Observations From RM #3

Azimuth Mark	290. (Slope Distance)	355° 02' 42".10
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Route Description: Gardner Pinnacles is reached by surface ship from Midway Island. There is no suitable boat landing on the pinnacle due to the surging surf under all but perfectly calm days. The currents around Gardner Pinnacle change quite fast and an alert watch must be kept for a current change while steaming close to the pinnacle.

GARDNER (6)

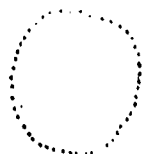
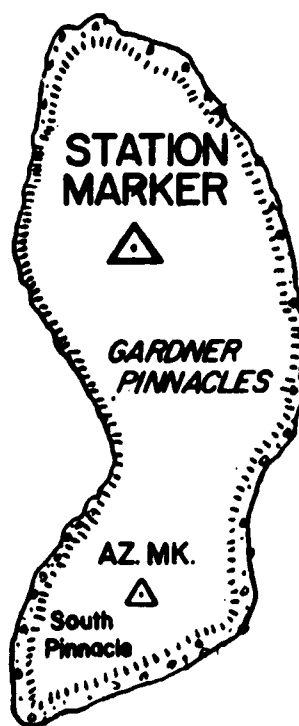
Helicopter operations on and around Gardner Pinnacle must be undertaken with extreme caution. Any wind will set up turbulence on the down wind approach. Hovering over the detached pinnacle should not be attempted if the detached pinnacle is leeward of the main pinnacle.

Remarks: It is possible with caution to climb from the station site to the azimuth mark.

AREA SKETCH GARDNER (6)



PACIFIC OCEAN



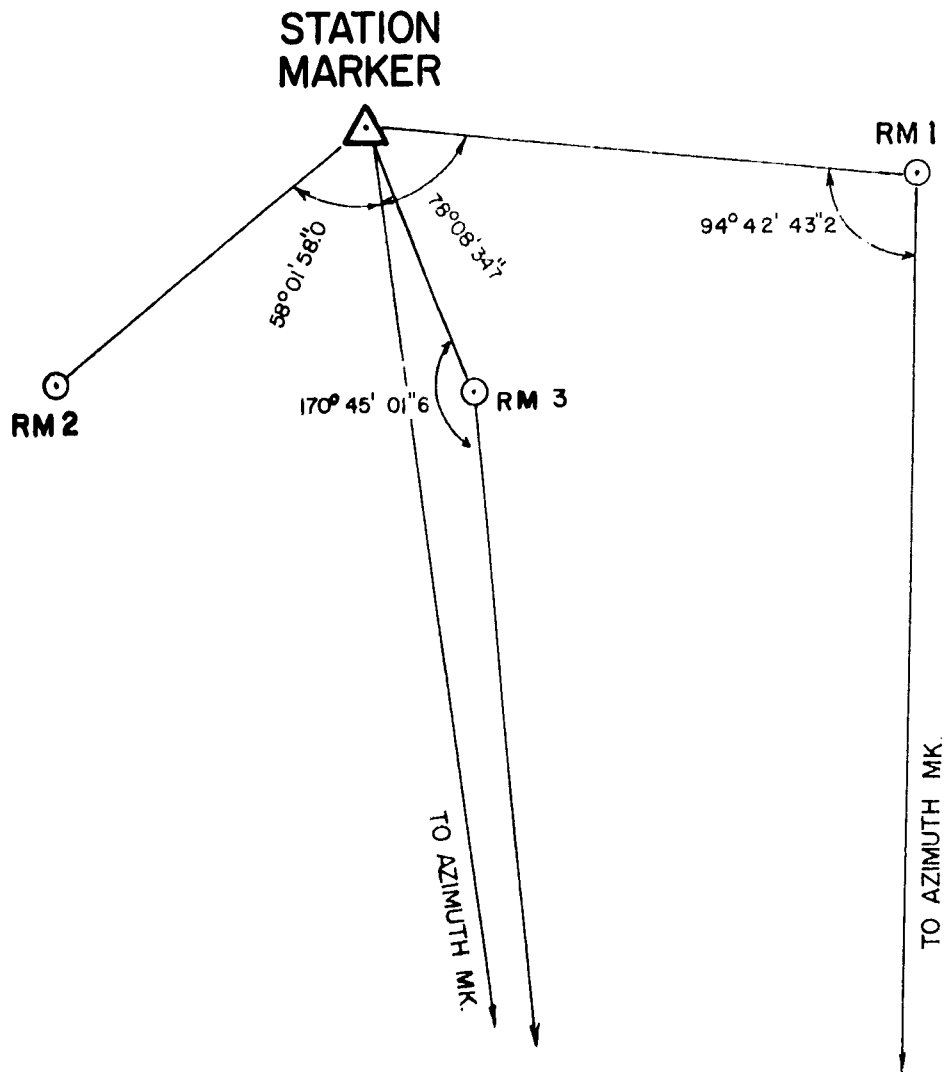
APRIL 1961

SCALE

0 50 100

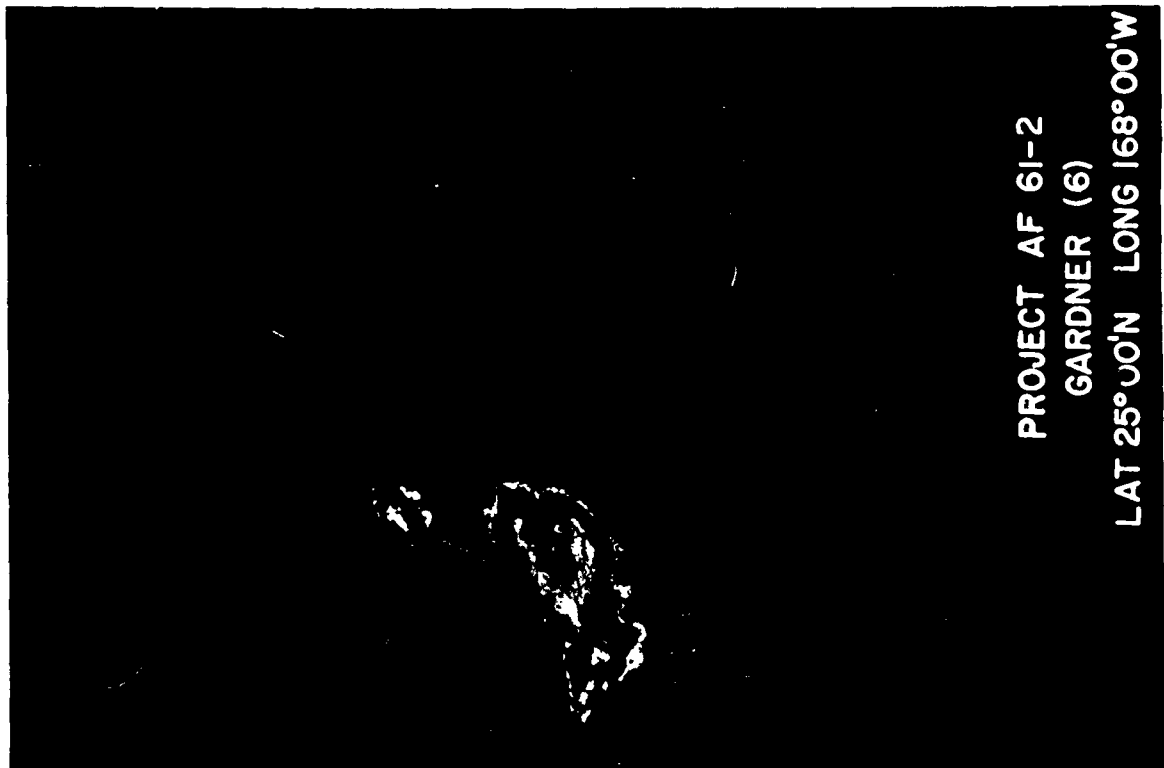
FEET

STATION SKETCH GARDNER (6)



APRIL 1961
SCALE





PROJECT AF 61-2

GARDNER (6)

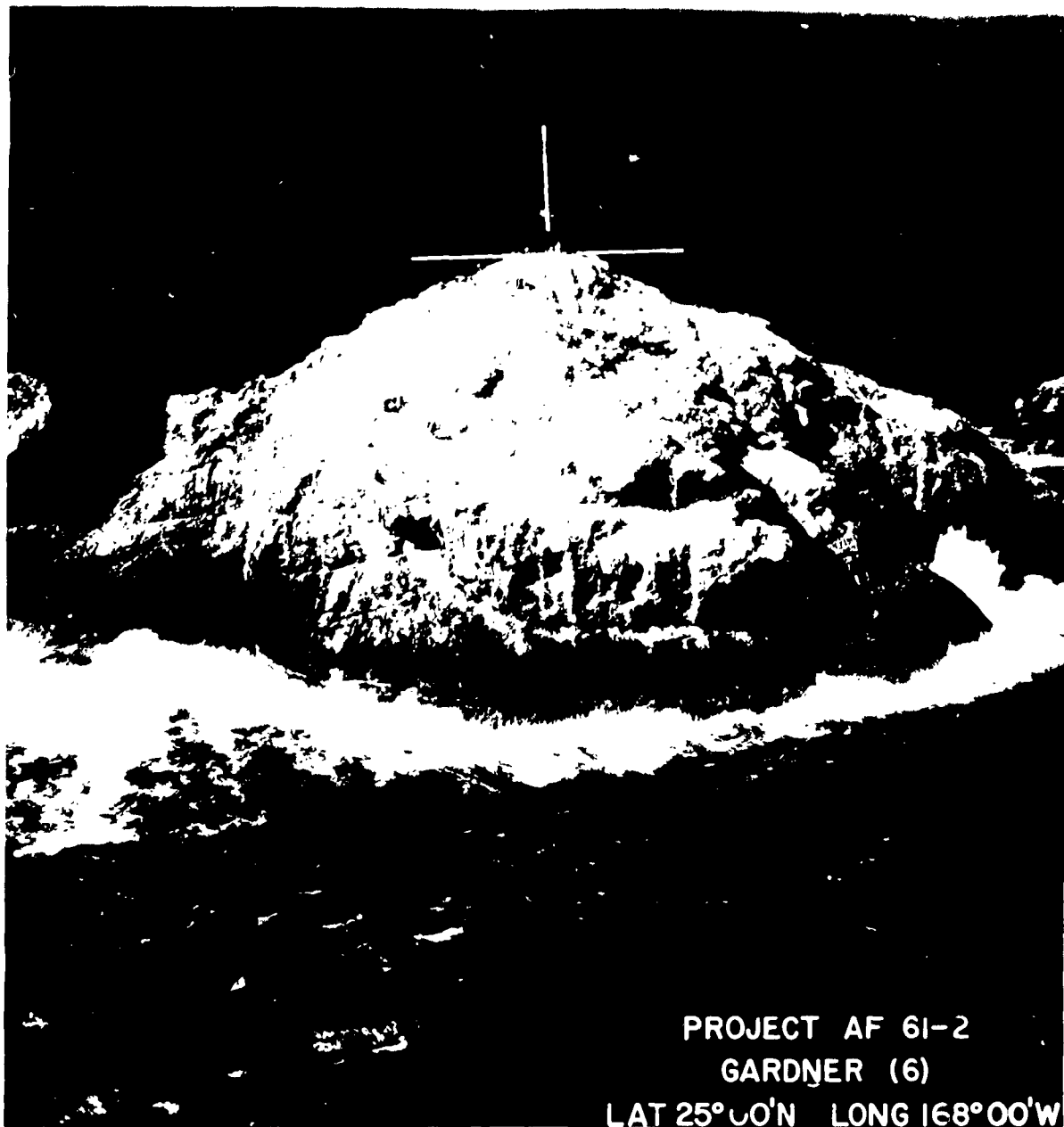
LAT 25° 00' N LONG 168° 00' W



PROJECT AP61-2

NUMBER (6)

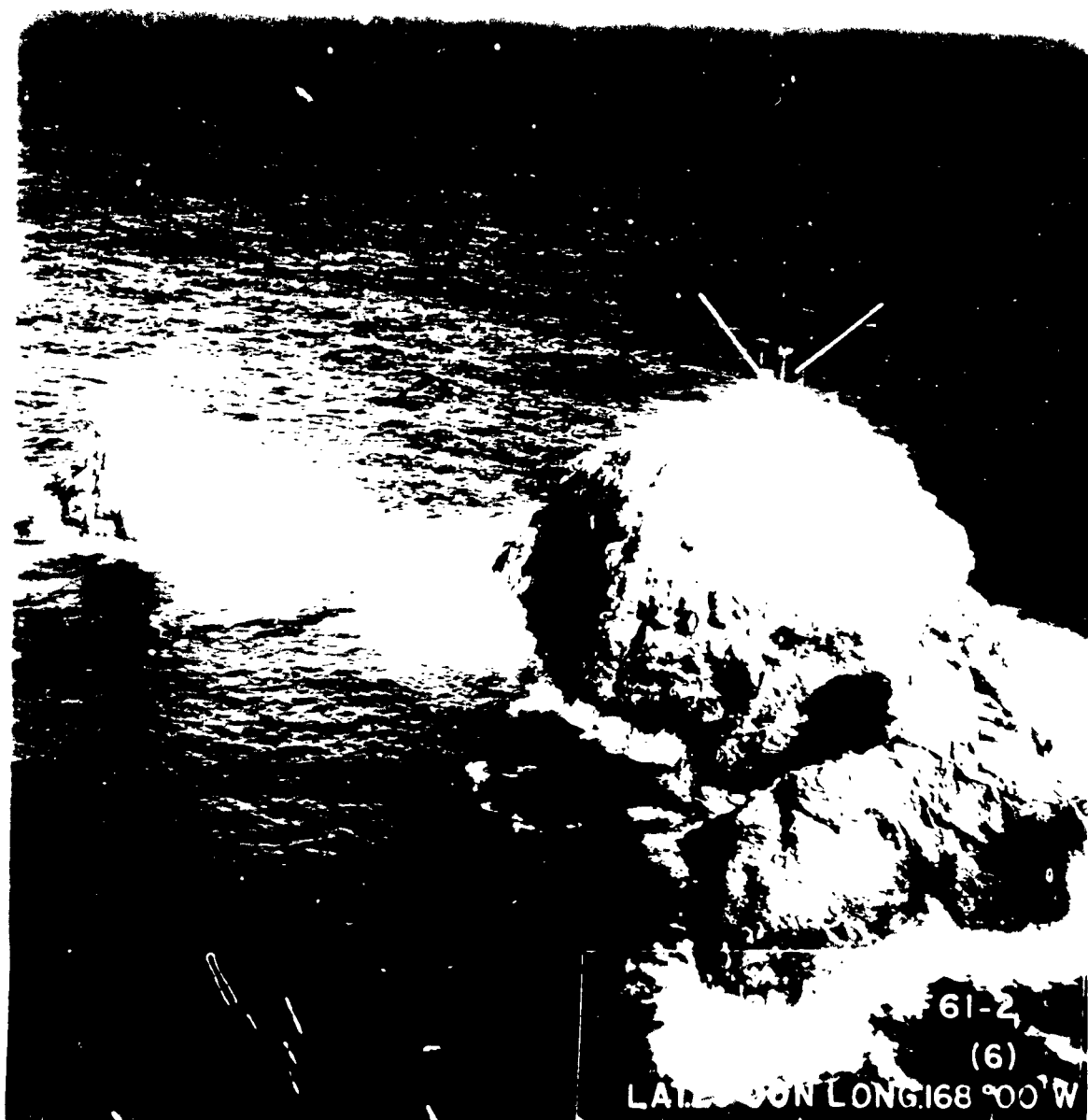
DOON LONG 168 4 J W



PROJECT AF 61-2

GARDNER (6)

LAT 25°00'N LONG 168°00'W



61-2

(6)

LAT. 30°N LONG. 168°00'W



HIRAN STATION DESCRIPTION

Name and Number: FRIG (7)

Location: Tern Island, French
Frigate Shoals,
Hawaiian Island Group

Date Established: 1961

Approximate Geographic Coordinates: Latitude: 23° 51' N
Longitude: 166° 17' W

Station Elevation: 6 Feet (Approx reference to mean tide level)

Description: Station Frig is located on the south side of Tern Island, approximately 800 feet from the east end of the Island, 25 feet north of the south beach and 40 feet south of the south edge of the runway. It is marked with a standard USC&GS triangulation disk stamped "FRIG 1961", capping a 2 1/2 inch diameter, 3 foot long pipe driven into the ground. The pipe is imbedded in a concrete monument 13 inches square which is also inscribed "FRIG 1961".

References: There is no RM #1. RM #2 is a standard USC&GS reference disk set in a concrete pier 16 inches square and 4 feet 6 inches high. The disk is stamped "FRIG RM NO 2 1961", which is also inscribed in the concrete. A T-3 tribrach was placed on top of the pier. RM #2 was the Sodano light tracking station. The azimuth marker is a standard USC&GS azimuth disk set on top of a dolphin made of three telephone poles. The disk is stamped "FRIG AZ MK 1961" and is set on top of and center of the south pole in the group, centered in a tribrach.

Observations from station:

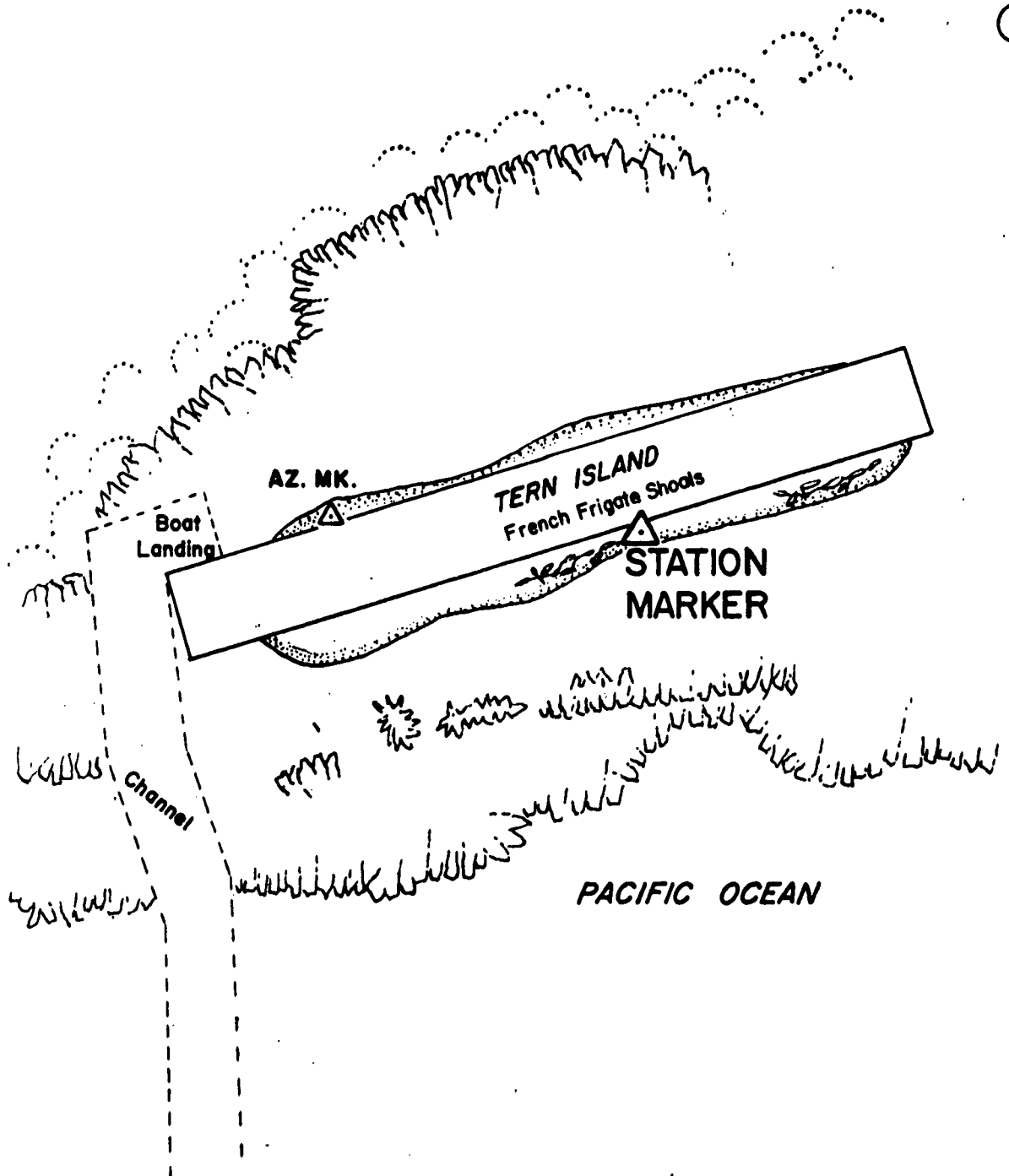
<u>OBJECT</u>	<u>DISTANCE (FEET)</u>	<u>AZIMUTH FROM SOUTH (ASTRONOMIC)</u>
RM #2	30.	208° 24' 44"

Observations from RM #2

Azimuth Mark	1600 (Approx)	83° 01' 07"03
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Route Description: Station Frig can be reached by either air or surface ship. Using surface ship, Oahu would be the port used. The best anchorage is located about 225°T and 2000 yards from the southwest channel entrance. The depth of the southwest channel to Tern Island was 16 feet in June 1952. Buoys mark the channel. Using air transportation, there is a 3000 feet hard packed coral runway.

AREA SKETCH FRIG (7)



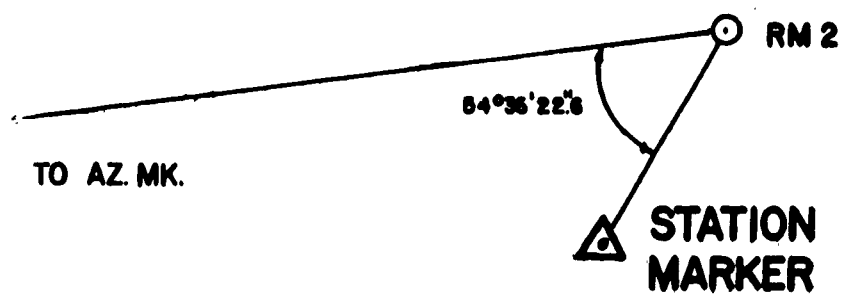
APRIL 1961

SCALE

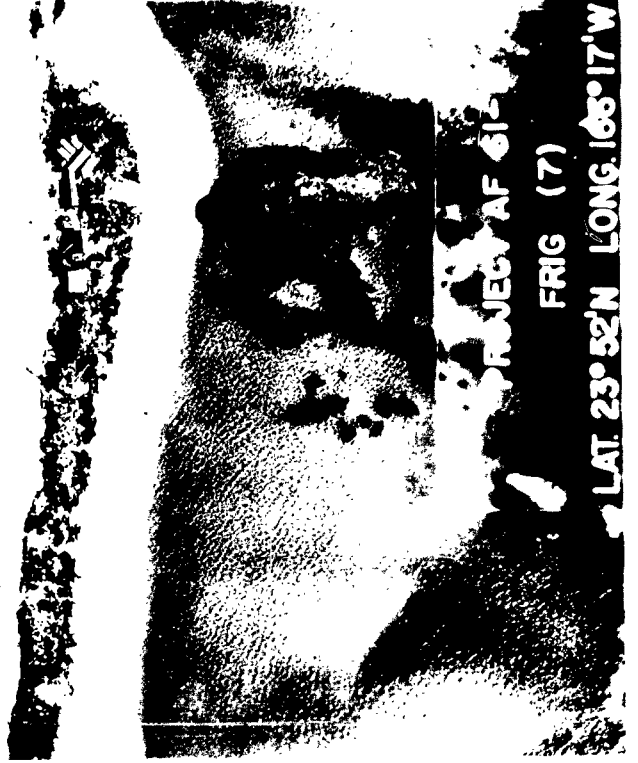
0 500

FEET

STATION SKETCH FRIG (7)



APRIL 1961
SCALE
0 10 20
FEET



PROJECT AF 61-2
FRIG (7)
LAT. 23° 52' N LONG. 168° 17' W

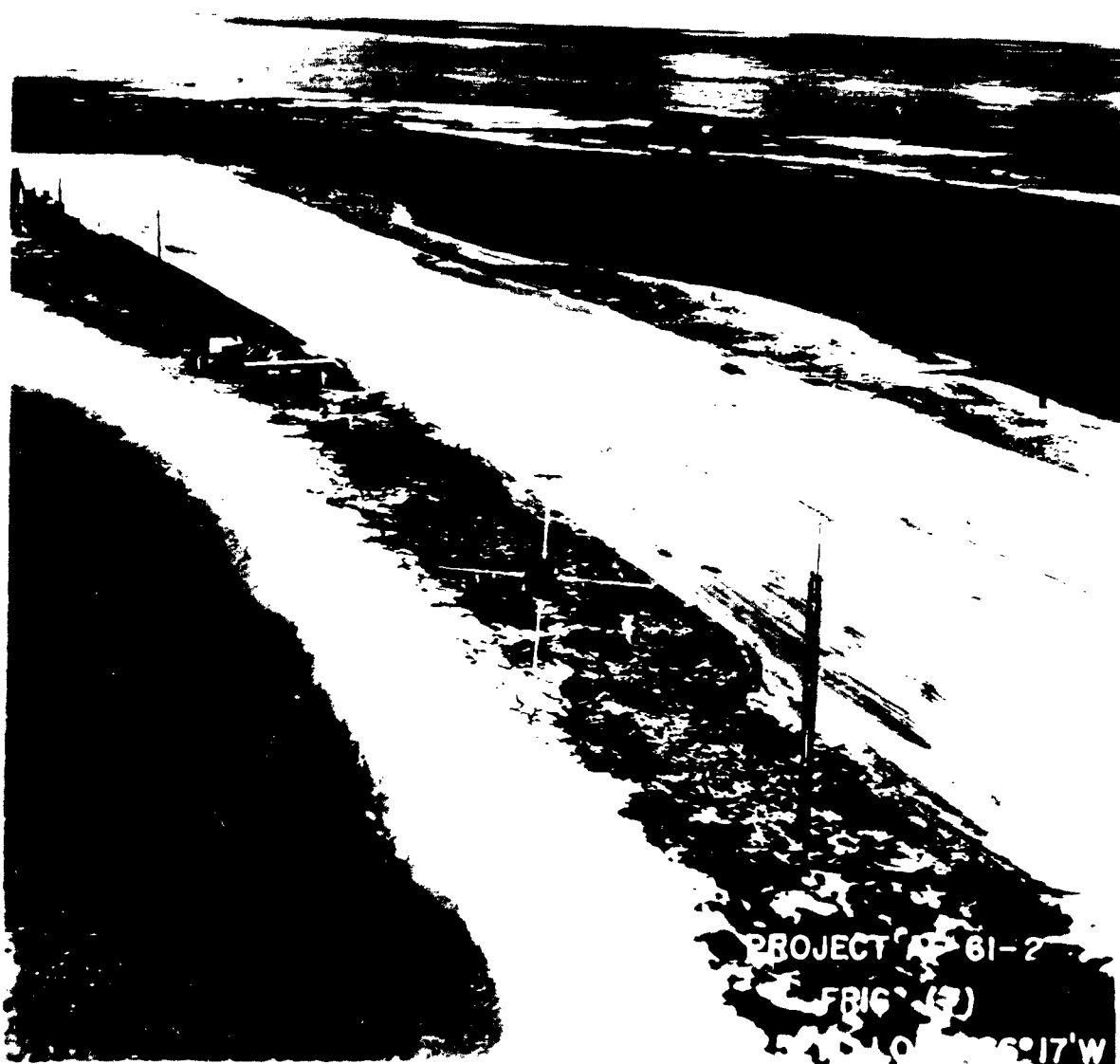


PROJECT AF 61-2

FRIG (7)

LAT. 23° 52' N LONG. 118° 15' E





PROJECT AF 61-2

FRIG (3)

54° 40' 26.17' W



HIRAN STATION DESCRIPTION

Name and Number: NECKER (8)

Location: Necker Island
Hawaiian Island Group

Date Established: 1961

Approximate Geographic Coordinates: Latitude: 23° 35' N
Longitude: 164° 42' W

Station Elevation: 261 feet (Barometric Leveling)

Description: Necker Island is a small steep-sided island, lying generally east and west, and composed mostly of lava rock. It is about 3/4 mile long and ranges from 277 to 249 feet high. The south profile shows five peaks. The station is located on a flat area on the second peak from the east end and is marked by a standard USC&GS triangulation disk cemented in a drill hole in the center of the peak, stamped "NECKER 1961".

References: RM #1 is a standard USC&GS reference disk cemented in a drill hole in bedrock, south of the station and approximately 12 feet north of a vertical cliff, and stamped "NECKER NO 1 1961". RM #2 is a standard USC&GS reference disk, north of the station and about 6 feet south of a vertical cliff, and stamped "NECKER NO 2 1961". A first-order azimuth was observed from RM #2 to a standard USC&GS azimuth disk placed on the top of the westernmost of the five peaks. This disk lies approximately 25 feet east from the centerpoint of a row of north-south upright stones and is stamped "NECKER 1961". An additional mark was observed during LaPlace observations. This mark is an old USC&GS hydrographic disk atop a prominent rock on the most easterly of the peaks at an approximate distance of 670 feet from the station. This mark is here called "AZIMUTH 2".

<u>OBJECT</u>	<u>DISTANCE (FEET)</u>	<u>AZIMUTH FROM SOUTH (ASTRONOMIC)</u>
RM #1	28.60	352° 40' 05".6
RM #2	34.73	166° 33' 49".4

Observations from RM #2

Azimuth #1	
(Primary)	102° 01' 49".48
Azimuth #2	277° 40' 35".78

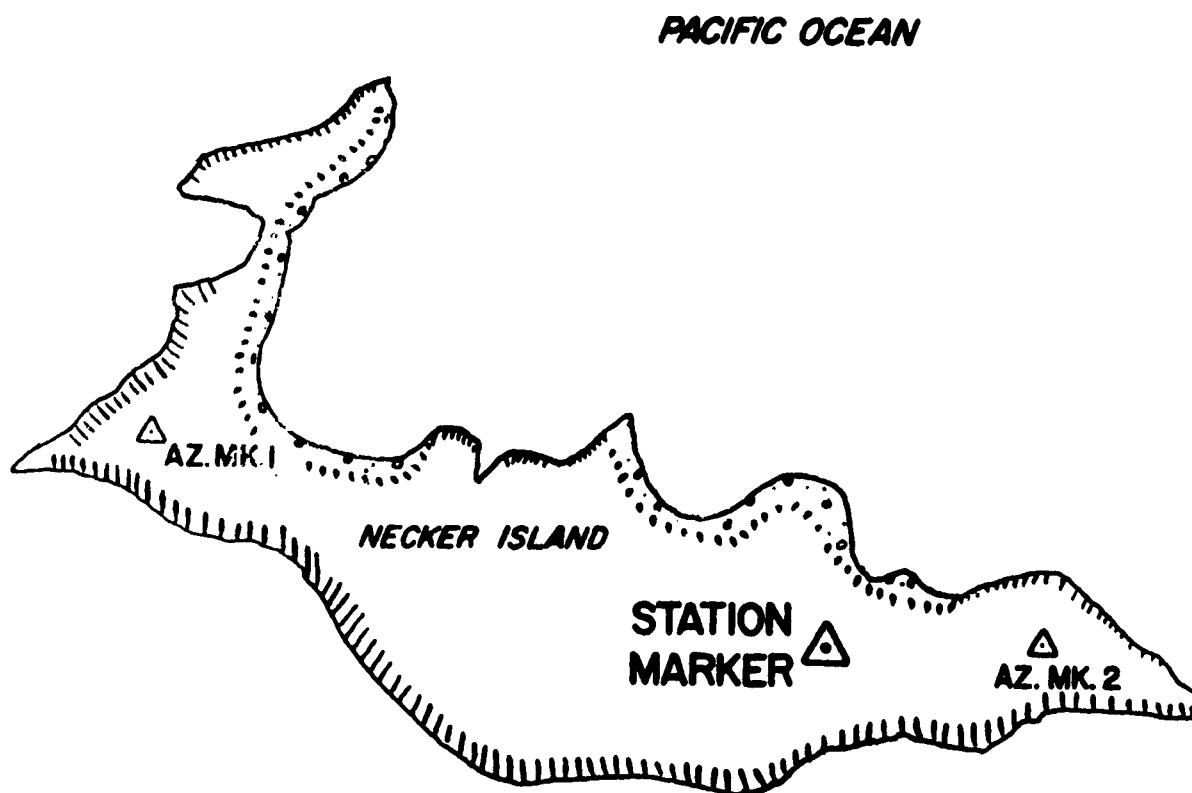
Route Description: Necker Island is reached by surface ship with Oahu being the closest port. A survey by helicopter showed all boat landings to be lava rock formations, awash under all surf conditions. The currents around the island are constantly changing and care should be taken while steaming within one mile of the island. There

NECKER (8)

are two possible helicopter landing sites, one being on the second peak from the island's west end, the other is located about 300 feet east of the station.

Remarks: There is a possible presence of explosives. The surf areas are still considered unsafe and should be avoided.

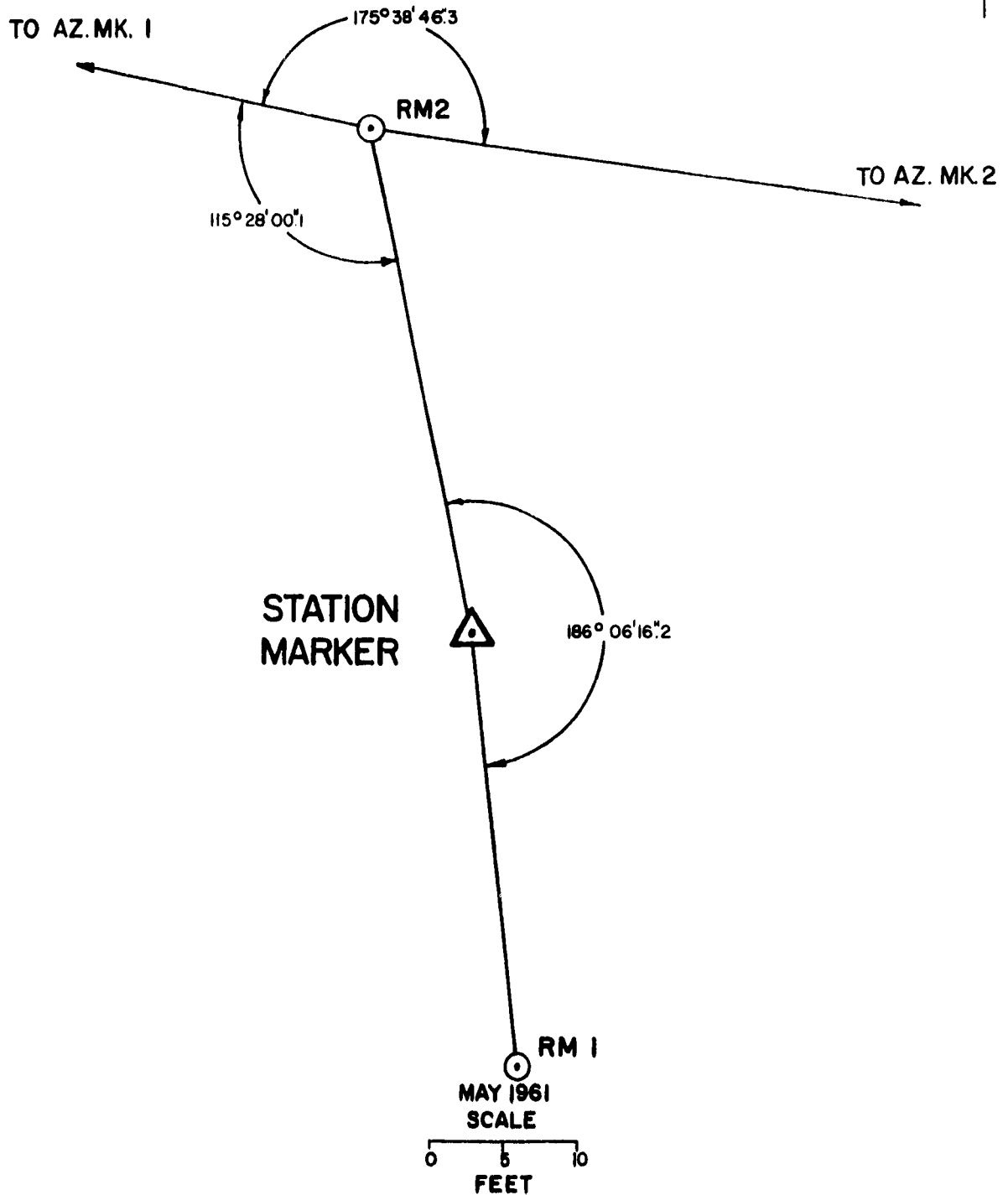
AREA SKETCH NECKER (8)

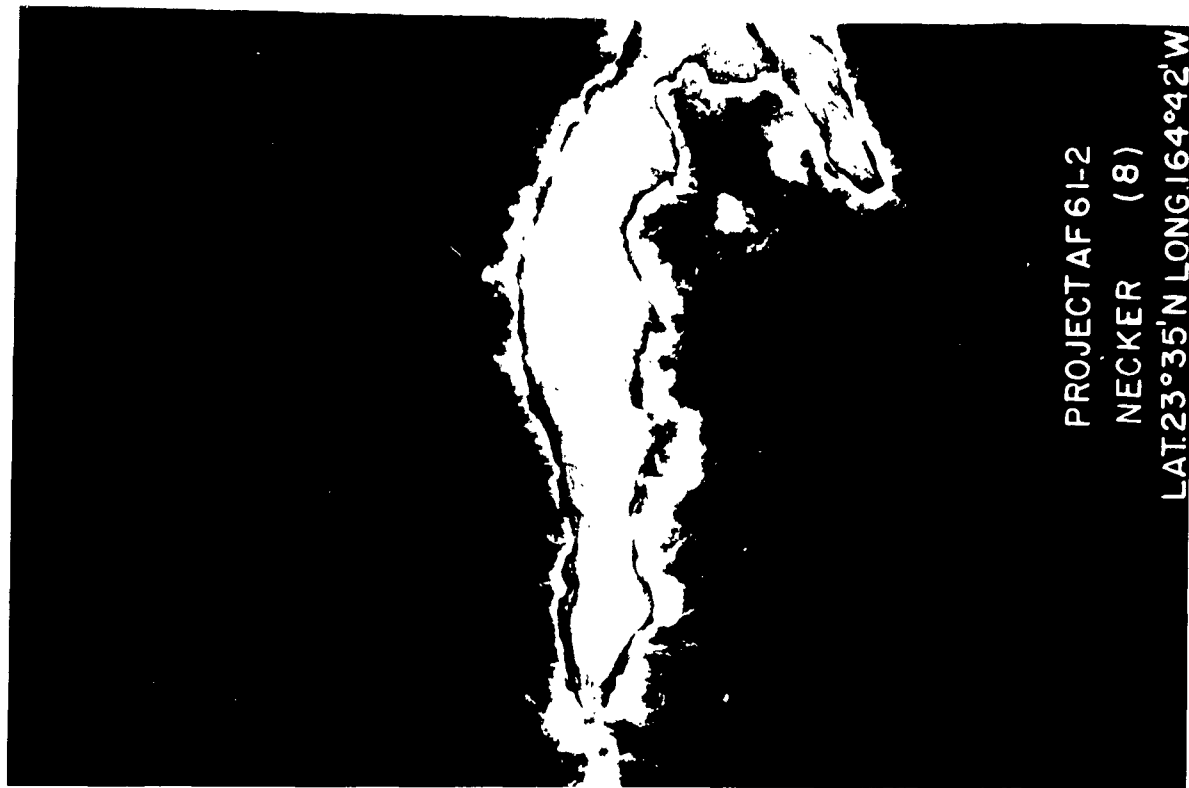


MAY 1961
SCALE

0 500 1000
FEET

STATION SKETCH NECKER (8)



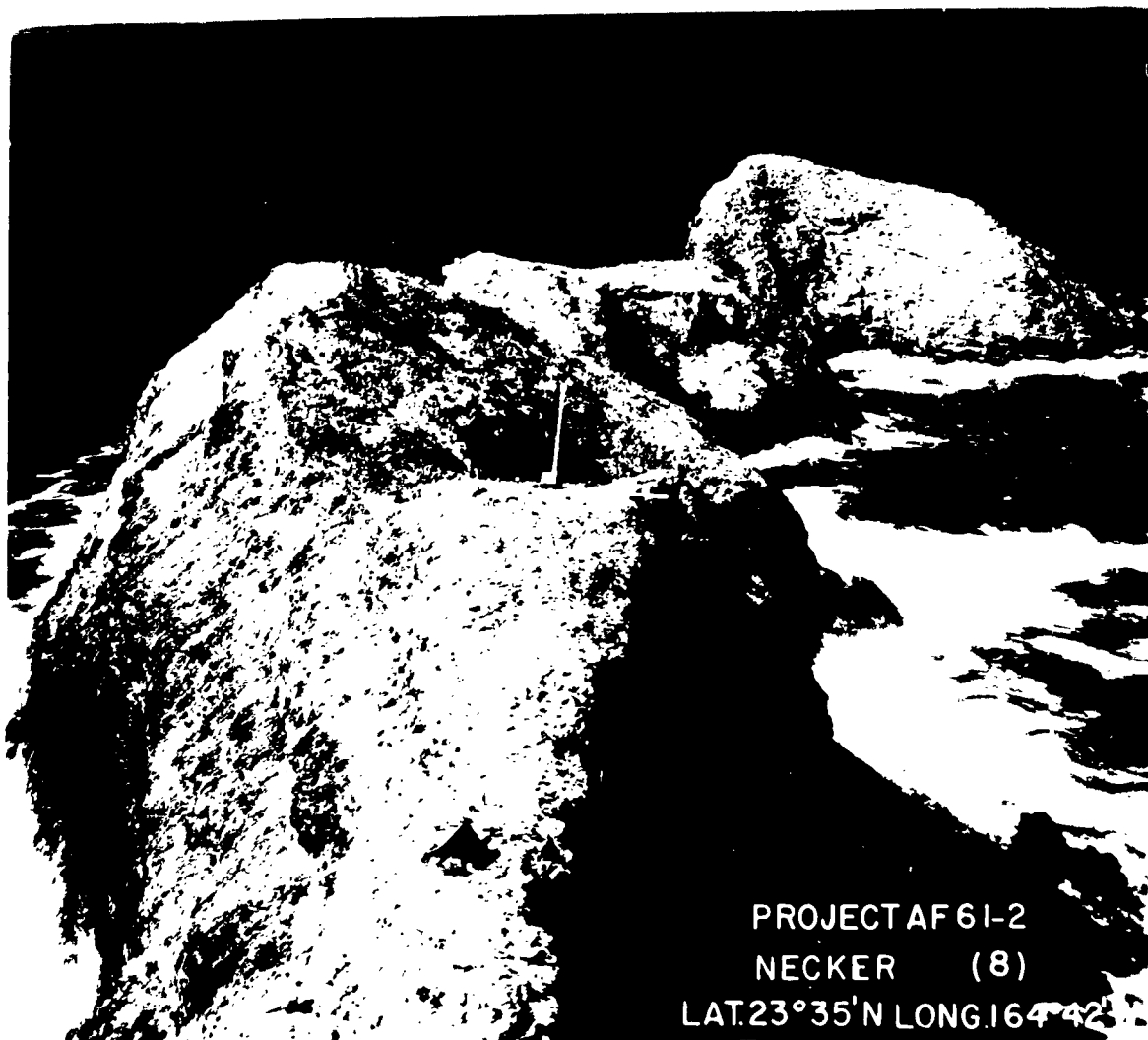


PROJECT AF61-2

NECKER (8)

LAT. 23° 35' N LONG. 164° 42' W





PROJECT AF 61-2
NECKER (8)
LAT. 23° 35' N LONG. 164° 42' W



